

## CLAIMS

We claim:

1           1.     A process for making a biocompatible biodegradable fleece, the process  
2 comprising:

3           a. providing a solution comprising a crosslinkable synthetic macromer, the synthetic  
4 macromer comprising a polymeric hydrophilic region surrounded by two or more regions each  
5 comprising one or more moieties forming a biodegradable region and a crosslinkable moiety;

6           b. freezing the solution in a desired shape;

7           c. vacuum-drying the solution; and

8           d. crosslinking the crosslinkable macromer  
9 to produce the fleece.

1           2.     The process of claim 1 wherein the vacuum-drying step is performed  
2 before the crosslinking step.

1           3.     The process of claim 1 wherein the vacuum-drying step is performed after  
2 the crosslinking step.

1           4.     The process of claim 1 wherein the macromer solution further comprises  
2 at least one of a polymerization-causing material and a biologically active agent.

1           5.     The process of claim 4 wherein the biologically active agent is selected  
2 from the group consisting of antibiotics, growth regulating molecules, hemostatic agents,

3 antibodies, antigens, transfection vectors, expression vectors, anesthetics, and anti-arrhythmic  
4 agents.

1 6. The process of claim 1, wherein the crosslinking is performed by the use  
2 of at least one of ionizing radiation, non-ionizing radiation, heat, addition of initiators, and  
3 addition of crosslinking chemicals or ions.

1 7. The process of claim 1, wherein the crosslinking is performed by a free  
2 radical polymerization reaction.

1 8. The process of claim 1 further comprising a rinsing of the crosslinked  
2 macromer.

1 9. The process of claim 8 further comprising the step of shredding the  
2 crosslinked macromer after rinsing.

1 10. The process of claim 1 further comprising the step of shredding the  
2 crosslinked macromer to form fleece particulates.

1 11. The process of claim 1 further comprising the step of shredding the  
2 crosslinked macromer after at least one of the freezing step and the vacuum-drying step.

1 12. The process of claim 1 wherein a supporting material is incorporated into  
2 the fleece.

1 13. The process of claim 12 where the incorporation of the supporting  
2 material occurs during the freezing step.

1 14. A biocompatible biodegradable fleece particulate produced by the process  
2 of claim 10.

1 15. The process of claim 10, further comprising the wetting of the fleece  
2 particulates with an aqueous solution.

1 16. The process of claim 15 further comprising the adding of at least one of a  
2 cell, a polymerization-causing material, and a biologically active agent to the wetted fleece  
3 particulates.

1 17. A biocompatible biodegradable fleece produced by the process of claim 1.

1 18. A biocompatible biodegradable fleece particulate produced by the process  
2 of claim 10.

1 19. A biocompatible biodegradable fleece particulate produced by the process  
2 of claim 16.

1 20. A biocompatible biodegradable fleece, wherein the fleece comprises  
2 crosslinked synthetic macromers, at least one of the synthetic macromers comprising a polymeric  
3 hydrophilic region surrounded by two or more regions each comprising one or more moieties  
4 forming a biodegradable region and a crosslinked moiety, and wherein the fleece is  
5 macroporous.

1                   21.    The fleece of claim 20, further comprised of at least one of a cell, a  
2 polymerization-causing material and a biologically active agent.

1                   22.    The fleece of claim 20 which is in the form of fleece particulates.

1                   23.    The fleece of claim 21 which is in the form of fleece particulates.

1                   24.    The fleece of claim 20, comprising a diacrylated polyethylene oxide  
2 comprising biodegradable linkages selected from the group consisting of monomers and  
3 oligomers of carbonates and hydroxyacids.

1                   25.    The fleece of claim 24, further comprised of at least one of a cell, a  
2 polymerization-causing material, and a biologically active agent.

1                   26.    The fleece of claim 24 which is in the form of fleece particulates.

1                   27.    The fleece of claim 25 which is in the form of fleece particulates.

1                   28.    The fleece of claim 20, wherein the fleece has at least two regions of  
2 differing composition.

1                   29.    The fleece of claim 1, wherein the crosslinkable macromer is water  
2 soluble.

1                   30.    The fleece of claim 1, wherein bubbles are incorporated into the solution  
2 before the freezing step.

1                   31.    A slurry comprising the biocompatible fleece particulates of claim 19 and  
2   an aqueous solution.

1                   32.    The slurry of claim 31, wherein the aqueous solution comprises at least  
2   one of a cell, a polymerization-causing material, and a biologically active agent.

1                   33.    A slurry comprising the biocompatible fleece particulates of claim 23 and  
2   an aqueous solution.

1                   34.    The slurry of claim 33, wherein the aqueous solution comprises at least  
2   one of a cell, a polymerization-causing material and a biologically active agent.

1                   35.    A slurry comprising the biocompatible fleece particulates of claim 27 and  
2   an aqueous solution.

1                   36.    The slurry of claim 35, wherein the aqueous solution comprises at least  
2   one of a cell, a polymerization-causing material, and a biologically active agent.

1                   37.    The method of treating a wound or defect by applying to the wound or  
2   defect the slurry of claim 31.

1                   38.    The method of treating a wound or defect by applying to the wound or  
2   defect the slurry of claim 33.

1                   39.    The method of treating a wound or defect by applying to the wound or  
2   defect the slurry of claim 35.



1                   47.     The method of claim 38 where the treatment comprises at least one of  
2 hemostasis, protection from the atmosphere, protection from drying, and delivering a cell or  
3 biologically active agent to the wound.

1                   48.     The use of the biocompatible biodegradable fleece of claim 20 for drug  
2 delivery.

1                   49.     The use of the biocompatible biodegradable fleece of claim 20 to prevent  
2 tissue adhesions.

1                   50.     The use of the biocompatible biodegradable fleece of claim 20 to culture  
2 cells and the subsequent implantation of the fleece with the cells to a defect.

1                   51.     The use of the biocompatible biodegradable fleece of claim 20 to provide  
2 a substrate for tissue engineering.

1                   52.     The method of treating a wound or defect by applying to the wound or  
2 defect a slurry comprising an aqueous solution and biocompatible fleece particulates of claim 27,  
3 which comprises cells selected from the group consisting of chondrocytes, cardiomyocytes, and  
4 stem cells.

1                   53.     The method of claim 52, wherein the stem cells are mesenchymal stem  
2 cells.

- 1           54.    A slurry comprising an aqueous solution and biocompatible fleece
- 2    particulates of claim 27, which comprises cells selected from the group consisting of
- 3    chondrocytes, cardiomyocytes, and stem cells.